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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/687,230	10/16/2003	Craig A. Kelly	1895-SPL	8063

7590 10/18/2007
Francis A. Cooch, Office of Patent Counsel
The Johns Hopkins University
Applied Physics Laboratory
11100 Johns Hopkins Road
Laurel, MD 20723-6099

EXAMINER

KISH, JAMES M

ART UNIT	PAPER NUMBER
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3737

MAIL DATE	DELIVERY MODE
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10/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/687,230

Applicant(s)

KELLY, CRAIG A.

Examiner

James Kish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments filed August 6, 2007 have been fully considered but they are not persuasive.

Applicant argues that the claimed invention uses microwave skin surface monitoring for physiological events whereas the prior art uses established methods to measure physiological events. Also, Applicant argues that Sun et al.'s reference to higher frequency measurements is based on variances with the heart cycles of rats as opposed to the heart cycle of humans. These arguments are moot in that the claims do not provide for any of these limitations. All claims are directed toward a non-invasive health monitoring system and/or method. The most specific limitation in regards to this is found in independent claims 25, 35 and 37. These method claims direct the invention toward specific uses such as cardiac and/or pulmonary monitoring. These are intended uses of the claimed invention in view of the method steps performed in each case being identical. The only difference is what is being monitored. Therefore, if a device is capable of performing the method on a heart, it is just as capable of being used to monitor the lungs. This is implied in Sun et al., in that what is disclosed is a non-invasive apparatus system for monitoring the autonomic nervous system. The autonomic nervous system includes, among others, elevation in blood pressure, increase in heart rate, contraction of blood vessels and contraction of pulmonary (column 5, lines 8-24). As of August 6, 2007, the claims of the current application could

just as easily be directed at monitoring the heart of Sprague-Dawley rats as it is directed toward monitoring the heart of humans.

Furthermore, the Examiner notes that it is unclear as to what is meant by "the literature" in the Applicant's Remarks, cited at page 14 of 16, lines 7-13.

In view of the above arguments, the rejections stated in the Office Action dated, March 6, 2007 still stand and are repeated below.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meyer (US Patent No. 6,308,098) in view of Sun et al. (US Patent No. 6,811,536). Meyer discloses a process for detecting the physical positions of a human being based on detecting a physiological signal dependent on a sympathetic/parasympathetic nerve system. In an arithmetic stage connected downstream from the calibration unit, the current quotient of the amplitude difference value $\Delta Z = Z_2(t_2) - Z_1(t_1)$ is determined continuously for the respective last impedance signal picked up by $Z(t)$ at these points in time, and a difference $(t_2 - t_1)$ of the points in time is calculated (column 3, lines 50-63)." Meyer further teaches a long-term slope memory, in which the slope values from a large number of impedance measurements are stored and a fluctuation curve determination

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stage, in which the curve of the time variability of their fluctuations is determined for all currently stored slope signals. A frequency analyzer for determination of the spectral power density of the fluctuation curve using a linear model [or a different known correlation or transformation process; column 5, lines 6-9] is downstream from this. An integrator stage for integration of the frequency components within two permanently programmed ranges is connected to the output of the frequency analyzer (column 4, lines 28-56). However, the evaluation of the spectral energy density does not necessarily require development of a relationship from two ranges, but may consider more ranges (column 5, lines 10-13). In the same field of endeavor, Sun teaches the use of Fourier Transformations in the monitoring of the autonomic nervous system. See column 3, line 38 through column 4, line 10. Sun teaches that micro-oscillations in the heart rate variability can generally be divided into a high (HF) and a low (LF) frequency, wherein the low frequency can be subdivided further. Also taught by Sun is a ratio of LF/HF. The autonomic nervous system includes not only the heart, but also contraction of the pulmonary (column 5, lines 8-24). While it is stated that the human frequency ranges comprise HF at 0.15-0.4 Hz and LF at 0.04-0.15 Hz, it is also taught that in some circumstances the high frequency range can spread from 0.5-2.4 Hz (column 9, lines 15-21). Splitting this range into two separate groups would be obvious to one of skill in the art as already disclosed by Sun to further subdivide the low frequency ranges. Sun also teaches to correct for distribution biases (i.e., normalization) for LF and HF values (column 10, lines 16-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a Fourier transform, as taught

by Sun, in the process of Meyer because Meyer suggests variations for processing, as well as the ability to increase the frequency ranges being sampled when monitoring the autonomic nervous system, which Sun provides for.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK


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SUPERVISORY PATENT EXAMINER
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